

Notice of Allowability

Application No.

10/065,795

Examiner

Vincent E Kovalick

Applicant(s)

ZEHNER ET AL.

Art Unit

2673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's amendment dated 2/22/05.
2. ☒ The allowed claim(s) is/are 2-12, 15-24, 27 and 29-72.
3. ☒ The drawings filed on 11/20/02 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Applicant's Amendment, dated February 22, 2005, in response to USPTO Office Action dated August 19, 2004.

The cancellation of claims 1, 13-14, 25-26 and 28; the amendments to claims 2-4, 8-12, 15, 17, 21 and 22-24 and the addition of new claims 31-72 are sufficient to place the application in a condition for allowance.

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Specification: page 1, line 8, insert Patent No. 6,531,997 and 6,504,524

Allowable Subject Matter

2. Claims 2-12, 15-24, 27 and 29-72 are allowed.
3. The following is an examiner's statement of reasons for allowance:
Relative to claim 2, the major difference between the teachings of the prior art of record (USP 5,604,616, Dunn et al.; USP 6,462,873, Tone and USP 5,586,055, Ng et al.) and

Art Unit: 2673

that of the instant invention is that said prior art of record **does not teach** a method of driving a bistable electro-optical display having a plurality of pixels, each of which is capable of displaying at least three gray levels; and further comprising storing data representing at least prior state of each pixel prior to said initial state thereof, and wherein said output signal is generated dependent upon both said at least one prior state and said initial state of said one pixel.

Regarding claim 8, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a method of driving a bistable electro-optical display having a plurality of pixels, each of which is capable of displaying at least three gray levels; and further comprising generating a life time signal representing the operating time of said pixel and generating said output signal dependent upon said lifetime signal.

As to claim 9, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a method of driving a bistable electro-optical display having a plurality of pixels, each of which is capable of displaying at least three gray levels; and further comprising generating a residence time signal representing the time since said pixel last underwent a transition and generating said output signal dependent upon said residence time signal.

Relative to claim 15, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a device controller for controlling a bistable electro-optic display having a plurality of pixels, each of which is capable of displaying at least three gray levels, said controller further comprising storage means arranged to store data representing at least one prior state of each pixel prior to said initial state

Art Unit: 2673

thereof, and said calculation means is arranged to determine said impulse dependent upon said input signal, said initial state of said pixel and said prior state of said pixel.

Regarding claim 17, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a device controller for controlling a bistable electro-optic display having a plurality of pixels, each of which is capable of displaying at least three gray levels, further comprising said controller wherein input means is arranged to receive a temperature signal representing the temperature of at least one pixel of the display, and said calculation means is arranged to determine said impulse dependent upon said input signal, said initial state of said pixel and said temperature signal.

Regarding claim 21, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a device controller for controlling a bistable electro-optic display having a plurality of pixels, each of which is capable of displaying at least three gray levels, said controller further comprising lifetime signal generation means arranged to generate a lifetime signal representing the operating time of said pixel, said calculation means determining said impulse from said input signal, said stored data representing the initial state of said pixel and said residence time signal.

As to claim 22, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a device controller for controlling a bistable electro-optic display having a plurality of pixels, each of which is capable of displaying at least three gray levels, said controller further comprising residence time signal generation means for determining the residence time since said pixel last under went a transition and for generating a residence time signal representing said residence time, said

Art Unit: 2673

calculation means determining said impulse from said input signal, said stored data representing the initial state of said pixel and said residence time signal.

Regarding claim 27, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach a** device controller comprising: storage means arranged to store both a look-up table containing data representing the impulses necessary to convert an initial gray level to a final gray level, and data representing at least an initial state of each pixel of the display; input means for receiving an input signal representing a desired final state of at least one pixel of the display; calculation means for determining, from the input signal, the stored data representing the initial state of said pixel, and the look-up table, the impulse required to change the initial state of said one pixel to the desired final state; and output means for generating an output signal representative of said impulse, the output signal representing a plurality of pulses varying in at least one of voltage and duration, the output signal representing a zero voltage after the expiration of a predetermined period of time.

Regarding claim 29, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach a** driver circuit comprising: output lines arranged to be connected to drive electrodes of an electro-optic display; first input means for receiving a plurality of 2-bit numbers representing the voltage and polarity of signals to be placed on the drive electrodes; and second input means for receiving a clock signal, the driver circuit being arranged such that, upon receipt of the clock signal, the driver circuit displays voltages selected from $R+V$, R and $R-V$ on its output lines, where R is a reference voltage and V is the maximum difference from the reference voltage that the driver circuit can assert.

Art Unit: 2673

Regarding claim 30, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a method for driving an electro-optic display having a remnant voltage, the method comprising: (a) applying a first driving pulse to a pixel of the display; (b) measuring the remnant voltage of the pixel after the first driving pulse; and (c) applying a second driving pulse to the pixel following the measurement of the remnant voltage, the magnitude of the second driving pulse being controlled dependent upon the measured remnant voltage to reduce the remnant voltage of the pixel.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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| U. S. Patent No. | 6,608,701 | Loce et al. |
| U. S. Patent No. | 5,615,016 | Thakur et al, |
| U. S. Patent No. | 5,261,010 | Lo et al. |


Art Unit: 2673

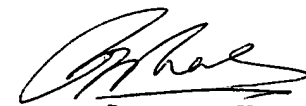
Responses

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent E Kovalick whose telephone number is (571) 272-7669. The examiner can normally be reached on Monday-Thursday 7:30- 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Vincent E. Kovalick
March 22, 2005


BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800